

MIURA 5

THE EUROPEAN AND REUSABLE MICROLAUNCHER
FOR CUBESATS AND SMALL SATELLITES>Pablo Gallego, PLD Space, pablo.gallego@pldspace.com

>PLDSPACE™

PLD Space is the emerging spaceflight company of Europe aiming to provide affordable, flexible and fast access to space. Currently there are two launch vehicles under development: MIURA 1 and MIURA 5

MIURA 1 – a sounding rocket – designed to provide access to the space environment and microgravity. Additionally, it serves as a technology demonstrator and flying test bed for MIURA 5.

MIURA 5 – a microlauncher – designed for delivering CubeSats and small satellites into a low earth orbit.

>MIURA 5 CHARACTERISTICS

MIURA 5 is a **two-stage launch vehicle**. Its first stage is propelled by five regeneratively cooled liquid engines which are designed and built in-house by PLD Space. The second stage is propelled by a single engine of similar design.

>Vehicle

Length:	25 m
Diameter:	1.8 m
Lift-Off Mass:	32.000 kg
Stages:	2 + optional kick-stage
Propellants:	LOX / Kerosene
Reusability:	First Stage

>First Stage

Length:	17.7 m
Engines:	5
Total Thrust:	408 kN (sea level)

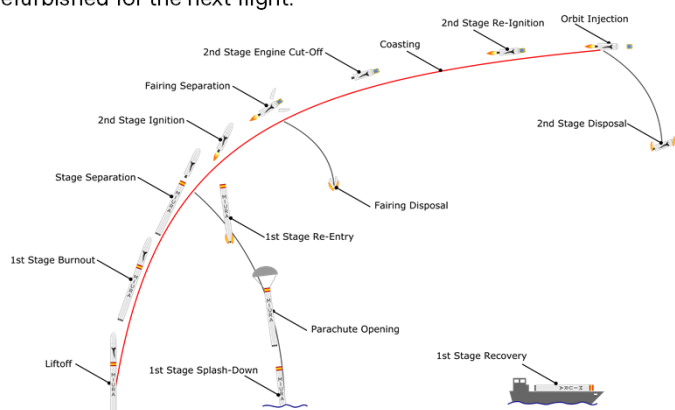
>Second Stage

Length:	9 m
Engines:	1
Total Thrust:	65 kN (vacuum)

>FLIGHT PHASES

The first stage of MIURA 5 burns for about 120 seconds before the first and second stage separate from each other and the second stage is ignited. At an altitude of about 110 km the fairing is ejected from the vehicle. A bit further into the flight, the second stage engine stops firing for a coasting phase until the target apogee is reached. Here the second stage is re-ignited for a circularization burn and then releases the payload into its desired orbit.

Parallel to the delivery of the payload into orbit, the first stage of MIURA 5 safely splashes down in the ocean. It is then recovered and refurbished for the next flight.



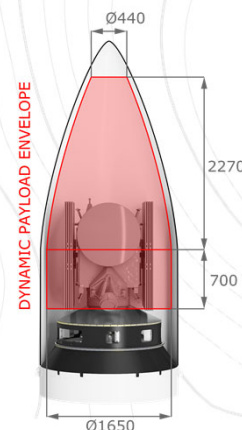
>PAYLOAD ACCOMMODATION

MIURA 5 is equipped with a lightweight carbon composite fairing with a volume big enough to house a huge variety of possible payload constellations underneath it. A dedicated launch, a piggy-back launch or a rideshare mission can easily be accommodated.

The **MIURA 5 payload adapter** can support almost all commercially available satellite deployment systems and CubeSat dispensers. The customer is free to choose a system that best fits the payload needs.

>Payload Fairing

Nominal Payload Mass:	300 kg to 500 kg SSO
Useable Length:	2.97 m
Useable Diameter:	1.65 m



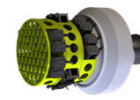
>Dedicated Launch

One satellite occupies the entire payload capacity.



>Piggy-Back Launch

A main satellite and multiple secondary satellites.



>Rideshare Launch

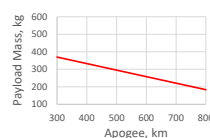
Multiple satellites with equal dimensions share a flight.

>PERFORMANCE

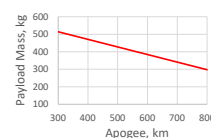
MIURA 5 can be launched from different launch sites on European territory. This flexibility allows the vehicle to deliver payloads into **variety of possible orbits**. As a baseline it is capable of launching 300 kg of payload into a 500 km Sun Synchronous Orbit (SSO) from the Guiana Space Centre.

>Example Launch Sites & Performance

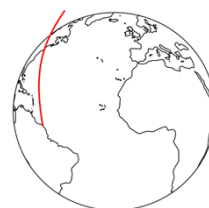
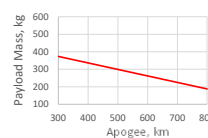
Guiana Space Centre to SSO



Guiana Space Centre to 45° inclination




Azores to SSO



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small
SATELLITE

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Conference, North Logan